
INCORPORATION OF ENVIRONMENTAL MANAGEMENT SYSTEMS INTO INTEGRATED POLLUTION CONTROL LICENSING IN IRELAND

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SUMMARY

The Irish Environmental Protection Agency issues Integrated Pollution Control Licenses to a wide range of activities posing a significant threat to the environment. These integrated licenses cover all environmental media, including noise. They focus on the elimination of waste at source through cleaner production and they take account of the best available technology not entailing excessive costs for each industrial sector. As well as specifying emission limit values, each license requires the activity to establish and maintain an Environmental Management System. The environmental management system includes environmental performance objectives and targets, a realistic programme to achieve those targets, a pollution emission register for major pollutants, and extensive environmental performance reporting. A cooperative relationship exists between industry and the Agency and win-win solutions aimed at increasing competitiveness and protecting the environment are encouraged. The Agency considers that proper design, control and maintenance of process equipment is fundamental to integrated pollution prevention and control.

The Agency has adopted the use of Environmental Audits as a means by which compliance with an Integrated Pollution Control license may be assessed. This approach is facilitated by the implementation of an Environmental Management System within licensed activities. As such, the Agency is involved in an holistic assessment of an activity's environmental performance, not only in terms of compliance with emission limit values but also in relation to their approach to environmental management and continuous improvement.

1 INTRODUCTION

Ireland enjoys, for the most part, a clean environment thanks primarily to an accident of history whereby the country missed out on the industrial revolution of the 19th century and to an accident of geography which places it on the Western edge of Europe surrounded by ocean and with prevailing Southwesterly winds. As a result, the two largest income-generating sectors of the Irish economy are agriculture and tourism and both rely heavily on a clean environment. Ireland is also a member of the European Union and must comply with a wide range of EU-driven environmental legislation.

As a result of these conditions, there is a substantial body of environmental legislation in Ireland and an Environmental Protection Agency was established in 1993, independent of Government, with a wide range of powers and functions. One such function is the licensing and regulation of industrial and other processes with significant polluting potential on the basis of Integrated Pollution Control and Best Available Technology Not Entailing Excessive Costs.

2 INTEGRATED POLLUTION CONTROL

Integrated Pollution Control aims to prevent pollution at its source through process design/redesign to eliminate emissions and substitute hazardous materials with less hazardous ones. It also aims to minimize releases to the environment as a whole by process control, inventory control, and end-of-pipe technology. The developer or operator is responsible for demonstrating that in selecting a process, all avenues for elimination and substitution have been examined and any appropriate measures adopted. Wider issues considered include raw material extraction, off-site power generation and the impacts of waste disposal. The license sets limit values for emissions to air, water, land and noise and these are monitored in the normal way by the licensee with unannounced check monitoring by the Agency. There is a recognition however that this type of command and control regime alone tends to focus on end-of pipe abatement and does not yield the full potential that exists for waste elimination and minimization and overall environmental protection at these licensed sites. The Agency decided to introduce some license conditions to raise environmental awareness throughout these facilities, to focus on the areas where greatest improvement could be achieved and to cater to on-going improvements.

3 ENVIRONMENTAL MANAGEMENT SYSTEMS

The Agency incorporates a condition requiring an Environmental Management System in Integrated Pollution Control Licenses. In general, this condition is as follows:

Condition 2 Environmental Management

- 2.1. The licensee shall establish and maintain an Environmental Management System (Environmental Management System) which shall fulfil the requirements of this license. The Environmental Management System shall assess all operations and review all practicable options for the use of cleaner technology, cleaner production and the reduction and minimization of waste, and shall include as a minimum those elements specified in the Conditions 2.2 to 2.9 below:
- 2.2. A schedule of Objectives and Targets
 - 2.2.1. The licensee shall prepare a schedule of Objectives and Targets. The schedule shall include time frames for the achievement of set targets. The schedule shall address a five year period as a minimum. The schedule shall be prepared to the satisfaction of the Agency and shall be submitted to the Agency within four months of date of grant of this license. The schedule shall be reviewed annually and amendments thereto notified to the Agency for agreement as part of the Annual Environmental Report
- 2.3. Environmental Management Programme (Environmental Management Programme)

- 2.3.1. The licensee shall, not later than six months from the date of grant of this license, establish and maintain an Environmental Management Programme, including a time schedule, for achieving objectives and targets. The Environmental Management Programme shall thereafter, form part of the Annual Environmental Report and shall be agreed with the Agency prior to implementation. It shall include:
 - designation of responsibility for targets;
 - the means by which they may be achieved;
 - the time within which they may be achieved.
- 2.3.2. A report on the programme, including the success in meeting agreed targets, shall be prepared and submitted to the Agency as part of the Annual Environmental Report. Such reports shall be retained on-site for a period of not less than seven years and shall be available for inspection by authorized persons of the Agency.
- 2.4. Pollution Emission Register
 - 2.4.1. The substances to be included in the Pollution Emissions Register shall be agreed with the Agency each year by reference to the list specified in the Annual Environmental Report guidance note. The Pollution Emissions Register shall be prepared in accordance with any relevant guidelines issued by the Agency and shall be submitted as part of the Annual Environmental Report.
 - 2.4.2. The licensee shall, not later than six months from the date of grant of this license and thereafter as part of the Annual Environmental Report, agree with the Agency on the list of substances to be included in the Pollution Emissions Register, and the methodology to be used in their determination.
- 2.5. Documentation
 - 2.5.1. The licensee shall establish and maintain an environmental management documentation system which shall be to the satisfaction of the Agency.
 - 2.5.2. The licensee shall issue a copy of this license to all relevant personnel whose duties relate to any condition of this license.
- 2.6. Corrective Action
 - 2.6.1. The licensee shall establish procedures to ensure that corrective action is taken should the specified requirements of this license not be fulfilled. The responsibility and authority for initiating further investigation and corrective action in the event of a reported nonconformity with this license shall be defined.
- 2.7. Awareness and Training
 - 2.7.1. The licensee shall establish and maintain procedures for identifying training needs, and for providing appropriate training, for all personnel whose work can have a significant effect upon the environment. Appropriate records of training shall be maintained.

- 2.7.2. Personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and/or experience, as required.
- 2.8. Responsibilities
- 2.8.1. The licensee shall ensure that a person in charge, as defined under the terms of the Environmental Protection Agency Act, 1992 shall be available on-site at all times when the activity is in operation. The person in charge shall also be available to meet with authorized persons of the Agency at all reasonable times.
- 2.9. Communications
- 2.9.1 The licensee shall put in place a programme to ensure that members of the public can obtain information concerning the environmental performance of the licensee. This programme shall be submitted for agreement to the Agency within six months of the date of grant of this license.
- 2.9.2. The licensee shall submit to the Agency, eighteen months from the date of grant of this license, and each calendar year thereafter, an Annual Environmental Report which shall be to the satisfaction of the Agency. This report shall include as a minimum the information specified in Schedule X and shall be prepared in accordance with any relevant guidelines issued by the Agency.

3.1 Environmental Management

The basic requirement is for the implementation of a management system which forms a basis for continuous, structured and quantifiable improvement in a company's environmental performance. This aim is synonymous with the objective of an Integrated Pollution Control license. In simple terms, an Environmental Management System can be defined as that part of the overall management system which deals with environmental issues relating to an activity; it does not by default mean any accredited standard. However, there are elements of commonality between the two as can be seen by comparing Figures 1 and 2 below.

Figure 1 Environmental Management System (EMAS)

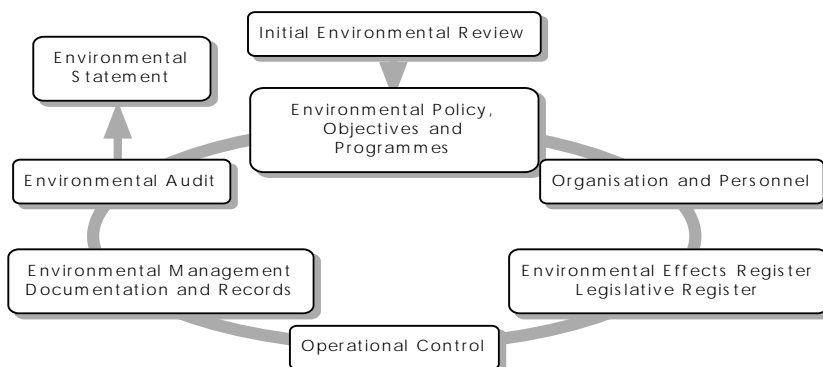
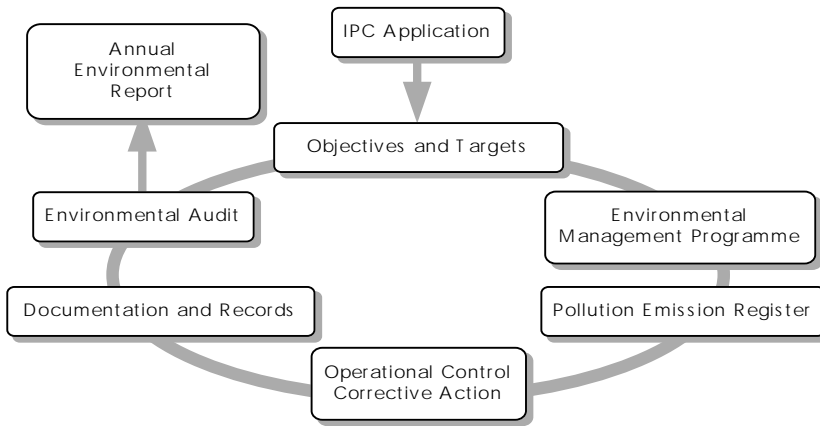


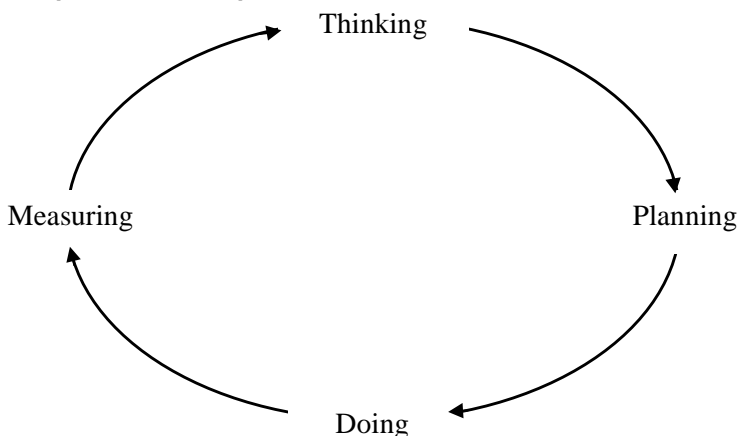
Figure 2 Environmental Management System (Integrated Pollution Control)

In addition many of the elements in the Integrated Pollution Control Environmental Management System are complementary to ISO 9000 quality systems which are widely implemented throughout industry, particularly;

Documentation	Training
Corrective actions	Responsibilities etc.

Hence the Integrated Pollution Control Environmental Management System can be operated as part of a quality system where this exists.

The core element within the Environmental Management System which drives continuous improvement is the Environmental Management Programme. In effect the Environmental Management Programme brings into play the principle of the continuous improvement loop (the Total Quality Management approach, Figure 3).

Figure 3 The Improvement Loop

- Thinking:** is the step to determine what the goals are, the targets to be achieved, the route to be taken and the measurements to track success. How will this be done?
- Planning:** is the step to design the activities to achieve the goal. Who will have to do what in-order to achieve the goal? What resources, skills and expertise are needed?
- Doing:** is the implementation of the plan.
- Measuring:** is the key to assessing the effectiveness of the doing stage.

The different elements of the Environmental Management System are elaborated on below.

3.2 Schedule of Objectives and Targets

The purpose of this requirement is to ensure that there are clear environmental goals within an organization as a whole. Targets must be demanding, as low level targets will not be approved by the Agency. Objectives and targets should be quantified wherever this is practical to ensure that real achievements can be recorded against the targets. The environmental targets must be documented, realistic time-scales for completion must be set and managers and staff alike must monitor progress of achieving targets within the time frame.

3.3 Environmental Management Programme

The purpose of the Environmental Management Programme is to ensure that the objectives and targets are supported by a realistic programme which is implemented throughout the organization. Each project proposal which forms part of the environmental management programme must address the following:

- Why:** undertake this project?
- What:** is the company going to do?
- When:** is it going to be done?
- Who:** is responsible to ensure it has been done properly?
- How:** is it going to be done?

3.4 Pollution Emissions Register

A Pollution Emissions Register is a register of potentially harmful pollutant releases or transfers from industries regulated by the EPA. The annual publication of the Pollution Emissions Register provides the public with comprehensive information on the use, control, transfer and release of pollutants in industry and creates a powerful motivation for waste reduction. The European Union Integrated Pollution Prevention and Control Directive makes provision, in Article 15, for the publishing, by the European Commission, of an inventory of the principal pollutant emissions and sources. This inventory is to be published every three years on the basis of data supplied by Member States. The Pollution Emissions Register information submitted to the Agency by Integrated Pollution Control licensees will form part of the Irish submission to this inventory.

The primary purpose of the Pollution Emissions Register is to ensure that the destination of major pollutants is tracked. Information provided by the register will assist industry to focus on problem pollutants and highlight priority areas for improvement when setting the next

year's objectives and targets. Also of benefit is the knowledge gained from a thorough understanding of material flows in a facility. This can result in options for waste reduction and improved operating procedures which are fundamental to Integrated Pollution Control Licensing.

3.5 Documentation

The purpose of this condition is to ensure that there is adequate documentation to support the environmental management system in operation. In terms of documented procedures, it is critical that the licensee issues comprehensive written operating instructions to all personnel involved in the operation of abatement/treatment facilities as pollution incidents can sometimes be traced back to a lack of clear written instructions for some key piece of equipment.

3.6 Corrective Action

Within the Environmental Management System, the licensee is required to establish procedures to ensure that corrective action is taken where a non-compliance is raised. Non-compliances are normally identified by measurement/monitoring or verification procedures. The responsibility and authority for initiating further investigation and corrective action in the event of a reported non-conformity with the license must be defined. The follow-up action to correct the problem is essential to demonstrate compliance with the license and for continued confidence in the management system.

3.7 Awareness and Training

Awareness and training is incorporated into the Environmental Management System in order to establish the necessary communications, training plans and training records to ensure that the license is sufficiently understood and integrated into the day-to-day business.

3.8 Audits

The implementation of an Environmental Management System in Integrated Pollution Control facilities is the mechanism by which the requirements of the license will be maintained throughout the company. Moreover, such a system puts in place an auditable entity which the Agency's audit team may assess in order to determine the performance (compliance) of the company in relation to its Integrated Pollution Control license.

3.9 Cooperation

From the beginning of Integrated Pollution Control licensing the Agency adopted a proactive role in encouraging industry-regulator dialogue on all issues of mutual concern. One outcome of this dialogue is an 8 day training course on environmental issues for senior management in industry which is organized and presented jointly by the Irish Business and Employers Confederation, the EPA, An Taisce (the largest environmental NGO in the country) and Clean Technology Consultants (CTC). This training course, which runs on one day every two weeks over a sixteen week period, is much in demand and the first successful programme is being repeated around the country.

3.10 Costs

The Agency extracts an annual charge from each licensed activity which covers all Agency costs involved in monitoring and controlling the license. Experience since 1994 has shown that, where a sound Environmental Management System is in place, the level of check monitoring and the extent and depth of auditing by the Agency is reduced with a corresponding reduction in the annual charge. Agreement has also been reached between the Agency and the National Accreditation Board, which implement the voluntary European Union Environmental Management and Audit Scheme in Ireland, to accept the results of Environmental Management and Audit Scheme audit in lieu of an Agency audit with further reduction in the annual charges.

3.11 Examples

Some examples of improvements arising from the introduction of an Environmental Management System are summarized below in Table 1. In many cases the improvements are small, but when small improvements are replicated over many sites, the overall effect is substantial.

Table 1. Examples of Improvements Arising from Environmental Management Systems

License No.	Details
18	Reduced 8 step synthesis to 6 steps Eliminated usage of Methylene Chloride Ammonia usage reduced by 90% Reduced Ethyl Bromide emissions by 83%
46	Drum reduction program 90% of drums replaced by IBC's
55	Recycling of wash-down water Reduced effluent discharge by 80%
115	Solvent recovery program Eliminated use of 12 tons TriChloroEthylene/annum
118	Packaging waste reduction program Reduced load to landfill by 50%
139	Organic solvent replacement Reduction from 30 tons to 8 tons per annum

4 ADVANTAGES OF THIS APPROACH

Based on the Irish experience over the past 3 years, the inclusion of an environmental management system in a pollution control permit is to be recommended to the regulator and the licensee for the following reasons :

- It is a structured environmental management tool.
- It allows for the preparation and implementation of environmental programmes.
- It leads to a reduction in emissions and minimization of waste.
- It provides improved environmental control.
- It can be monitored easily through environmental audits.
- It can often lead to cost savings.
- It improves corporate image.
- It meets stakeholder demands.
- It can improve market access and security.

5 EFFECT ON THE IRISH ECONOMY

The introduction of Integrated Pollution Control licensing and mandatory Environmental Management System in Ireland has coincided with an extraordinary growth in the Irish economy, which has outstripped all other European Union member states over the past 5 years. While many factors have contributed to this success, it is reasonable to conclude that sound environmental laws and strict control and enforcement does not hamper economic development but is essential if that development is to be sustainable in the years ahead.

